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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/066,115	02/01/2002	Peter Jivan Shah	020103	6021

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QUALCOMM, INC  
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EXAMINER

BHATTACHARYA, SAM

ART UNIT PAPER NUMBER

2688

DATE MAILED: 11/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/066,115

Applicant(s)

SHAH, PETER JIVAN

Examiner

Sam Bhattacharya

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 47-92 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 47-92 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. ____.  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date ____.   | 6) <input type="checkbox"/> Other: ____.                                    |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 47-72, 75, 78 and 81-92 are rejected under 35 U.S.C. 102(e) as being anticipated by Faulkner (U.S. Patent 6,606,484).

Regarding claim 47, Faulkner discloses a circuit including a compensation branch 5 for reducing second order non-linear distortion in a receiver 3, 8 caused by jammers during direct down conversion of a received RF signal by the receiver, the compensation branch being adapted to be coupled to the receiver to reproduce the second order nonlinear distortion (intermodulation interference) in the receiver (see col. 3, lines 52-67 and col. 5, lines 5-10) and including: a gain stage 6, 7 for generating the reproduced second order nonlinear distortion (see col. 3, lines 43-52), and an output coupling circuit 10 or S for coupling the reproduced second order nonlinear distortion to an output of the receiver to generate a down-converted baseband signal characterized with reduced second order nonlinear distortion (see col. 4, lines 1-19).

Regarding claim 48, Faulkner discloses that the compensation path includes a squaring circuit. See col. 3, lines 56-62.

Regarding claims 49 and 50, Faulkner discloses that the receiver is a zero-IF or a low-IF direct down conversion receiver. See col. 1, lines 42-47.

Regarding claim 51, Faulkner discloses that the output coupling circuit is an adder. See col. 4, lines 1-19 and col. 5, lines 22-36.

Regarding claims 52-56, that the receiver includes a mixer, and the stage receives a signal from the mixer having an amplitude which is representative of the second-order nonlinear distortion in the receiver. See col. 3, lines 43-62.

Regarding claims 57-59, 61, that the receiver defines a receiver path and the compensation path operates to provide feed forward second order nonlinear distortion reduction to the receiver path.

Regarding claims 60 and 62, that the nonlinear distortion elimination does not introduce other nonlinear distortion in the receiver path.

Regarding claims 63-71, discloses calibration of the gain stage, including factory calibration and auto-calibration. See col. 1, lines 28-42, col. 4, lines 20-32, col. 5, lines 49-62, and col. 6, lines 10-34.

Regarding claims 72, 75 and 78, discloses that the circuit and receiver are on a single integrated circuit. See col. 3, lines 52-67.

Regarding claim 81, Faulkner discloses an integrated circuit having a receiver 3, 8 and a distortion reduction circuit 5 for reducing second order non-linear distortion in a receiver 3, 8 caused by jammers during direct down conversion of a received RF signal by the receiver, the distortion reduction circuit being adapted to be coupled to the receiver to reproduce the second order nonlinear distortion (intermodulation interference) in the receiver (see col. 3, lines 52-67 and col. 5, lines 5-10) and including: a gain stage 6, 7 for generating the reproduced second order nonlinear distortion (see col. 3, lines 43-52), and an output coupling circuit 10 or S for coupling

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the reproduced second order nonlinear distortion to an output of the receiver to generate a down-converted baseband signal characterized with reduced second order nonlinear distortion (see col. 4, lines 1-19).

Claim 82 incorporates the limitations of claims 49, 50 and 81, and is therefore rejected for the same reasons as claims 49, 50 and 81.

Regarding claims 83-85, Faulkner discloses calibration of the gain stage, including factory calibration and auto-calibration. See col. 1, lines 28-42, col. 4, lines 20-32, col. 5, lines 49-62, and col. 6, lines 10-34.

Regarding claim 86, Faulkner discloses an output coupling circuit 10 for subtracting the unwanted second order nonlinear distortion from an output of the receiver to generate a down-converted baseband signal characterized with reduced second order nonlinear distortion. See col. 3, lines 59-62.

Claim 87 incorporates the limitations of claims 49, 50 and 86, and is therefore rejected for the same reasons as claims 49, 50 and 86.

Regarding claims 88-90, Faulkner discloses calibration of the gain stage, including factory calibration and auto-calibration. See col. 1, lines 28-42, col. 4, lines 20-32, col. 5, lines 49-62, and col. 6, lines 10-34.

Regarding claim 91, Faulkner discloses subtracting, using a feed forward technique, the unwanted second order nonlinear distortion from an output of the receiver to generate a down-converted baseband signal characterized with reduced second order nonlinear distortion. See FIG. 1 and col. 4, lines 1-10.

Regarding claim 92, Faulkner discloses calibration of the gain stage. See col. 1, lines 28-42, col. 4, lines 20-32, col. 5, lines 49-62, and col. 6, lines 10-34.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 73, 74, 76, 77, 79 and 80 are rejected under 35 U.S.C. 103(a) as being unpatentable over Faulkner in view of Rahamim (US 5,541,990).

Regarding claims 73, 74, 76, 77, 79 and 80, Faulkner fails to specifically disclose that the circuit and receiver are coupled to a modem for signal processing of the down-converted signal and being responsive to a test signal generated under control of the modem to provide the calibration.

In an analogous art, Rahamim discloses a modem coupled to a receiver Rxin and which includes an integrated circuit in which distortion is reduced. See FIG. 3 and col. 3, lines 37-45. The integrated circuit is responsive to a test signal generated under control of the modem. See col. 4, lines 17-32. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the apparatus of Faulkner by including a modem and receiver coupling configuration taught by Rahamim so that the number of components in the circuit and receiver are reduced due to a signal processing and testing being controlled from outside the apparatus.

***Response to Arguments***

5. Applicant's arguments filed 2/4/05 have been fully considered but they are not persuasive.

Contrary to Applicant's arguments, Faulkner is clearly concerned with minimizing distortion caused by intermodulation products, and not just eliminating DC offsets, as disclosed in col. 3, lines 43-62. Moreover, the second order nonlinear distortion in the circuit of Faulkner is caused at least in part by jammers in the receiver, as disclosed in col. 5, lines 5-10. Faulkner also discloses calibration of several characteristics of the receiver, including the gain, frequency response and distortion characteristic, as disclosed in col. 4, lines 20-38.

***Conclusion***

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sam Bhattacharya whose telephone number is (571) 272-7917.

The examiner can normally be reached on Weekdays, 9-6, with first Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, George Eng can be reached on (571) 272-7495. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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GEORGE ENG  
PRIMARY EXAMINER